

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460



OFFICE OF CHEMICAL SAFETY AND
POLLUTION PREVENTION

[SEQ CHAPTER \h \r 1] **MEMORANDUM**

Date: 07-JAN-2021

SUBJECT: **Aldicarb.** Revised Acute Aggregate Dietary (Food and Drinking Water)
Exposure and Risk Assessments Supporting Domestic Uses on Orange and
Grapefruit.

PC Code: 098301

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40 CFR: §180.269

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Summary of Revisions

This revised dietary assessment includes the following modifications to the previous dietary assessment for aldicarb (D444345, W. Donovan, 28-NOV-2017) as a result of a request to add domestic uses of aldicarb in/on oranges and grapefruit:

- 1) Updated projected percent crop treated (PCTn) information taking into account production cap limits proposed by the petitioner (BEAD memo: L. Hendrick, 07-JAN-2021). These changes are summarized in the following table:

| Revisions to Maximum Percent Crop Treated (PCT) Estimates for Aldicarb Uses on Orange and Grapefruit. | | |
|---|--------------------------|-----------------------|
| Commodity | 28-NOV-2017 Analysis PCT | Current Analysis PCTn |
| Orange | 3 | 13 |
| Orange juice | 20 | 63 |
| Grapefruit | 2 | 13 |
| Grapefruit juice | 2 | 16 |

- 2) Direct incorporation of time-series estimates of drinking water concentrations (EDWCs) to include potential residues in surface water sources as provided by the Environmental Fate and Effects Division (EFED). EDWCs were provided based on assuming aldicarb soil-incorporation depths of 2 and 3 inches, and including percent crop area (PCA) estimates of 20.8% and 14.2%, for Texas and Florida, respectively.

Executive Summary

Acute aggregate dietary (food and drinking water) exposure and risk assessments were conducted using the Dietary Exposure Evaluation Model software with the Food Commodity Intake Database (DEEM-FCID) Version 3.16. This software uses 2003-2008 food consumption data from the U.S. Department of Agriculture's (USDA's) National Health and Nutrition Examination Survey, What We Eat in America, (NHANES/WWEIA). The analyses were conducted in support of the registration action for domestic uses of aldicarb in/on orange and grapefruit, under production cap limits.

Acute dietary exposure assessments incorporated USDA Pesticide Data Program (PDP) monitoring data for aldicarb and its metabolites aldicarb sulfoxide and aldicarb sulfone, anticipated residues, field trial data, tolerances, processing factors (empirical and default), and percent crop treated (CT) estimates. Aldicarb metabolites were assumed to have similar toxicity to the parent.

Acute assessments were conducted for food and drinking water. Coffee, pecan, and potato were included in support of uses on imported commodities. Commodities with registered uses in the U.S.A. were included with their corresponding %CT. Sugar beet and sugarcane were excluded from the assessments, since aldicarb residues would not be expected in the processed commodities as consumed.

These acute assessments incorporated an estimated half-life for red blood cell (RBC) cholinesterase (ChE) inhibition of two hours, which is based on aldicarb data from rats and human subjects. A chronic assessment was not conducted because the toxicity database for aldicarb indicates that cholinesterase inhibition (ChEI) is the most sensitive effect found, the magnitude of ChEI does not increase with continued exposure, and that ChEI is generally reversible within 24 hours at the levels relevant to the dietary risk assessment. The longer-term exposures could be considered as a series of acute exposures, with regard to ChEI. All other effects noted in the sub-chronic and chronic toxicity studies were observed at higher doses.

Aldicarb is classified as not likely to be carcinogenic to humans; therefore, a cancer dietary assessment was not conducted.

Several acute dietary analyses were conducted to characterize the risk associated with the established and proposed uses of aldicarb. Specifically, EFED provided estimated drinking water concentrations (EDWCs) reflecting soil incorporation depths of 2 and 3 inches for aldicarb applied near orange and grapefruit trees, both in Florida and in Texas. Risk estimates for the 3-inch incorporation depth scenario are not of concern. Based on Florida PCA refined EDWCs, at the 99.9th percentile of exposure, the general U.S. population occupies 43% aPAD. The most highly exposed population subgroup, children 1-2 years old, occupies 95% aPAD. Based on Texas PCA refined EDWCs, at the 99.9th percentile of exposure, the general U.S. population occupies 46% aPAD. The most highly exposed population subgroup, children 1-2 years old, occupies 97% aPAD.

Risk estimates for the 2-inch incorporation depth scenario are of concern. Based on Florida PCA refined EDWCs, at the 99.9th percentile of exposure, the general U.S. population occupies 53% aPAD. The most highly exposed population subgroup, children 1-2 years old, occupies 103% aPAD. Based on Texas PCA refined EDWCs, at the 99.9th percentile of exposure, the general U.S. population occupies 65% aPAD. The most highly exposed population subgroup, children 1-2 years old, occupies 126% aPAD.

I. Introduction

Dietary risk assessment incorporates both exposure and toxicity of a given pesticide. For acute and chronic assessments, the risk is expressed as a percentage of a maximum acceptable dose (i.e., the dose that HED has concluded will result in no unreasonable adverse health effects). This dose is referred to as the population-adjusted dose (PAD). The PAD is equivalent to the point of departure (POD, NOAEL, LOAEL, e.g.) divided by the required uncertainty or safety factors.

For acute and non-cancer chronic exposures, HED is concerned when estimated dietary risk exceeds 100% of the PAD. References that discuss the acute and chronic risk assessments in more detail are available on the EPA/pesticides web site: "Available Information on Assessing Exposure from Pesticides, A User's Guide," 21-JUN-2000, web link: <http://www.epa.gov/fedrgstr/EPA-PEST/2000/July/Day-12/6061.pdf>; or see SOP 99.6 (20-AUG-1999).

The most recent dietary risk assessment for aldicarb was conducted by W. Donovan (28-NOV-2017, D444345).

II. Residue Information

Residues of Concern

The residues of concern for tolerance enforcement and risk assessment are the combined residues of aldicarb and its two cholinesterase-inhibiting metabolites aldicarb sulfoxide [2-methyl-2-

(methylsulfinyl)propionaldehyde O-(methyl carbamoyl) oxime] and aldicarb sulfone [2-methyl-2-(methylsulfonyl)propionaldehyde O-(methyl carbamoyl) oxime]. In field trials, parent aldicarb is typically at or just above the limit of detection (LOD); however, residues of aldicarb sulfoxide and/or aldicarb sulfone are detected more often and at higher levels than that of aldicarb. Aldicarb sulfoxide residues are found more frequently than the sulfone, and tend to be higher than sulfone residues when both are present. In monitoring data, parent aldicarb is rarely detected. Aldicarb sulfoxide is considered to be as potent as the parent in terms of toxicity, while the sulfone may be less potent. For risk assessment, the metabolites are assumed to have toxicity equivalent to parent compound aldicarb.

Tolerances

Tolerances are established in the 40 CFR § 180.269 for the use of aldicarb on bean, sugar beet, cotton, grapefruit, lemon, lime, orange, peanut, pecan, potato, soybean, sugarcane and sweet potato. These tolerances are based on measurement of combined residues of aldicarb and its cholinesterase-inhibiting metabolites aldicarb sulfoxide [2-methyl-2-(methylsulfinyl)propionaldehyde O-(methyl carbamoyl) oxime] and aldicarb sulfone [2-methyl-2-(methylsulfonyl)propionaldehyde O-(methyl carbamoyl) oxime] and range from 0.02 to 1 ppm. The tolerances for dry bean, sugar beet, cotton, peanut, soybean and sweet potato are based on domestic uses of aldicarb. Although tolerances for potato, citrus, pecan, and sugar cane are established in the CFR, there are no registered uses in the U.S.A. As tolerances for these commodities are in the CFR at this time, these commodities were considered in the dietary assessment assuming that residues of aldicarb may be present in imported commodities, unless indicated otherwise by BEAD analysis. Although livestock feedstuffs are associated with uses of aldicarb, tolerances are not established for livestock commodities because transfer of residues to livestock commodities is not expected (i.e., a 40 CFR §180.6(a)(3) situation applies) (D425180, W. Donovan, 18-FEB-2016).

Anticipated Residues

USDA PDP monitoring data for sweet potato, and orange (translated to other citrus commodities) were incorporated in the dietary assessment. The PDP was specifically designed for risk assessment; analysts prepare samples in a manner similar to typical consumer practices, such as washing, coring, and peeling. In years 2006 to 2012, USDA PDP analyzed several commodities for residues of aldicarb and its metabolites separately. PDP monitoring data were used for residues of aldicarb and its metabolites in/on sweet potato and citrus (orange, lemon, lime and grapefruit). Field trial data provided in previous dietary assessments (D299883, C. Olinger, 16-AUG-2010; and D430197, I. Negrón-Encarnación, 28-MAR-2016) were used for soybean, dry beans, pecan, cottonseed, and peanut. Sugar beet and sugarcane were excluded from the assessments, since aldicarb residues would not be expected in the processed commodities as consumed. Attachment A.1.2 and A.1.3 summarizes the residue inputs (anticipated residues, processing factors, PCT, etc.) and all of the residue distribution files (RDFs), respectively, used for the acute assessment.

Residues of parent aldicarb, aldicarb sulfone, and aldicarb sulfoxide were combined using a Statistical Analysis System (SAS) program that matches residues from the same samples using the PDP sample IDs. The SAS program directly created the RDFs for use in the acute analysis. In some cases, residues of either aldicarb or its metabolites may have not been detected or the

samples may not have been analyzed for all residues. The set of rules outlined in Table 1 were used to combine the residues for each sample. The total residue was calculated as aldicarb using the following formula, which accounts for the difference in molecular weights of the parent and two metabolites:

$$\text{Total residue (as aldicarb)} = \text{aldicarb} + (\text{aldicarb sulfone} \times 0.86) + (\text{aldicarb sulfoxide} \times 0.92)$$

In order to incorporate non-detectable residues into the exposure assessment, HED used the current policy [refer to ChemSAC (Chemistry Science Advisory Council) memo dated 5/19/98 and HED SOP 99.6] of assigning residue values of $\frac{1}{2}$ LOD to these samples. If the residues were determined as the sulfone, then the $\frac{1}{2}$ LOD for the total residue determined as the sulfone was used in the analysis. When the parent and metabolites were determined individually, using a $\frac{1}{2}$ LOD of 0.005 ppm (i.e., LOD = 0.01 ppm) for aldicarb and each of its metabolites, for example, the combined $\frac{1}{2}$ LOD is as follows:

$$\text{Total } \frac{1}{2} \text{ LOD residue (ppm)} = 0.005 + (0.005 \times 0.86) + (0.005 \times 0.92) = 0.0139 \text{ ppm}$$

In the case of field trial data, which is reported on an aldicarb sulfone basis, the conversion to the aldicarb basis is done using the following formula, which accounts for the differences in molecular weights:

$$\text{Aldicarb residues} = \text{aldicarb sulfone residues (ppm)} \times 0.86$$

Table 1. Method for Combining Residues of Aldicarb and it Sulfone and Sulfoxide Metabolites from the Same PDP Sample.

| Aldicarb | Metabolite | Data Treatment ¹ |
|------------|------------|---|
| detect | detect | Aldicarb detect + Metabolite detect |
| detect | non-detect | Aldicarb detect + $\frac{1}{2}$ LOD for Metabolite for that sample |
| non-detect | detect | $\frac{1}{2}$ LOD for Aldicarb for that sample + Metabolite detect |
| non-detect | non-detect | Highest $\frac{1}{2}$ LOD for Aldicarb + $\frac{1}{2}$ LOD for Metabolite |

¹ The highest limit of detection (LOD) for aldicarb and its metabolites was used to estimate the LOD to be included in the RDF file or used in point estimate calculations. When aldicarb or its metabolites were not detected, the $\frac{1}{2}$ LOD of that sample was used and added to the concentration of the analyte that was detected.

Processing Factors

Processing factors (PFs) for aldicarb in cooked potato food forms (0.62 for fried; 0.5 for boiled), dry beans (0.05 for baked, boiled, fried, canned:cooked, canned:boiled, cooked:no food form specified), soybean oil (0.3), peanut oil (0.18), and cottonseed oil (0.1), sugarcane, and sugar beet have been generated in processing/cooking studies submitted in support of reregistration. The studies were considered to be acceptable and appropriate for use in risk assessment and tolerance reassessment. The processing/cooking studies indicate a general reduction of residues; since residues are systemic, the reduction in residues is not related to removal of certain inedible commodity fractions, e.g., peel. Aldicarb processing factors to specific food forms in DEEM is described in Table 2. Processing factors for citrus juice were not needed as PDP data for orange juice was available.

| Table 2. Summary of Aldicarb Processing Factors (PFs) Used in the Dietary Exposure Analyses | | |
|--|-----------------|--|
| Commodity/Processed Food Form | PF ¹ | Application of PF to Relevant Food Forms in DEEM |
| Potato, dry | 6.5 | Potato, dry; Potato, flour |
| Potatoes/fried | 0.62 | Potato and Sweet potato:Fried |
| Potatoes/boiled, cooked | 0.5 | Potato and Sweet potato - boiled, canned:cooked, canned:boiled |
| Beans, dry | 0.05 | Baked, boiled, fried, canned:cooked; canned:boiled; cooked:NFS |
| Peanut/oil | 0.18 | Peanut/Oil |
| Peanut/butter | 1.2 | 2018 HED Default PF |
| Soybean/oil | 0.3 | Soybean/Oil |
| Cottonseed/oil | 0.1 | Cottonseed/Oil |
| Sugarcane/sugar beet | NA | NA |

¹Processing factors were entered into the DEEM software as Adjustment Factor 1.

Residues in Fish

The USDA PDP monitored pesticide residues in catfish in 2008, 2009, and 2010. Over this 3-year period, PDP analyzed 1479 samples of catfish for residues of aldicarb and aldicarb sulfone, and 552 samples for residues of aldicarb sulfoxide. None of the samples contained detectable residues. Moreover, PDP monitored pesticide residues in salmon in 2013 and 2014. Over this 2-year period, PDP analyzed 88 and 29 samples of salmon for residues of aldicarb sulfone and aldicarb sulfoxide, respectively. None of the samples contained detectable residues. As a result, residues in fish were not included in the assessment.

III. Percent Crop Treated Information

The Biological Economic Analysis Division (BEAD) provided projected percent of crop treated estimates for orange, orange juice, grapefruit, and grapefruit juice in the following memorandum: “Aldicarb Use on Oranges and Grapefruit: Benefits, Estimated Percent Crop Treated (PCT) for use in Risk Assessments, and Anticipated Impacts of Mitigation” (D454270, J. Hansel, R. Waterworth, and L. Hendrick, 07-JAN-2021). Percent crop treated estimates for other registered crops were as used in the previous dietary assessment (D444345, W. Donovan, 28-NOV-2017). The projected percent crop treated estimates for orange, orange juice, grapefruit and grapefruit juice took into account production cap limits proposed by the registrant.

The following maximum percent crop treated estimates (Updated Screening Level Usage Analysis Report for Aldicarb, PC Code 098301; 12/18/2014) were used in the acute dietary risk assessment: cotton: 35%; dry bean: 2.5%; grapefruit, 13%; grapefruit juice, 16%; lemon: 10%; orange, 13%; orange juice, 63%; pecan: 58%; peanut: 45%; processed potato, 4%; soybean: 2.5%; and sweet potato: 34%. The remaining commodity (lime) assumed 100% crop treated.

IV. Drinking Water Data

Drinking water residue estimates have been provided by the Environmental Fate and Effects Division (EFED) in the following memorandum: "Aldicarb: Drinking Water Exposure Assessment (DWA) for Proposed New Use on Citrus Grown in Florida" (D460216, J. Lim, 07-JAN-2021).

For the current assessment, HED included the contribution of potential residues in drinking water through a timeseries of daily averages of estimated aldicarb concentrations as generated and provided by EFED. Specifically, EFED provided 4 files of surface water estimates for 2 and 3 inch application depths reflecting both Texas and Florida percent crop treated refinements as follows: 1) 2" FL PCA, 2) 2" TX PCA, 3) 3" FL PCA, and 4) 3" TX PCA. These files, with water concentrations expressed in ppm, were converted to residue distribution files for analysis using the DEEM program.

EFED noted that groundwater estimates are highly dependent on well setback distances. As the orange/grapefruit use specifies 1000' well setbacks, it is appropriate to include surface water estimates in the dietary assessment as these concentrations are protective for residues from groundwater sources. With 300' well setbacks, the groundwater concentrations are expected to be higher than those from surface water and the contributions are expected to be similar at well setbacks of approximately 500'.

V. DEEM-FCID Program and Consumption Information

Aldicarb acute dietary exposure assessments were conducted using the DEEM-FCID, Version 3.16, which incorporates 2003-2008 consumption data from USDA's NHANES/WWEIA. The data are based on the reported consumption of more than 20,000 individuals over two non-consecutive survey days. Foods "as consumed" (e.g., apple pie) are linked to EPA-defined food commodities (e.g., apples, peeled fruit - cooked; fresh or N/S; baked; or wheat flour - cooked; fresh or N/S, baked) using publicly available recipe translation files developed jointly by USDA/ARS and EPA. For acute exposure assessment, consumption data are retained as individual consumption events. Based on analysis of the 2003-2008 WWEIA consumption data, which took into account dietary patterns and survey respondents, HED concluded that it is most appropriate to report risk for the following population subgroups: the general U.S. population, all infants (<1 year old), children 1-2, children 3-5, children 6-12, youth 13-19, adults 20-49, females 13-49, and adults 50-99 years old.

For an acute exposure assessment, individual one-day food consumption data are used on an individual-by-individual basis. The reported consumption amounts of each food item can be multiplied by a residue point estimate and summed to obtain a total daily pesticide exposure for a deterministic exposure assessment, or "matched" in multiple random pairings with residue values and then summed in a probabilistic assessment. The resulting distribution of exposures is expressed as a percentage of the aPAD on both a user (i.e., only those who reported eating relevant commodities/food forms) and a per-capita (i.e., those who reported eating the relevant commodities as well as those who did not) basis. In accordance with HED policy, per capita exposure and risk are reported for analyses performed at all levels of refinement. However, for

deterministic assessments, any significant differences in user vs. per capita exposure and risk are specifically identified and noted in the risk assessment.

The acute adverse effect of red blood cell cholinesterase inhibition tends to reverse itself within 2 hours following exposure to aldicarb. Since the food diaries used by DEEM-FCID (Version 3.16) Model are based on total daily intake, the estimated risks produced by this software are overestimates, to the extent that foods and drinking water are consumed throughout the day, rather than during only one event. To provide a better approximation of the potential exposure leading to peak RBC ChE inhibition, potential exposure from food and/or water to aldicarb was computed incrementally throughout the day. This computation was made by incorporating information on the time of day and amounts consumed during each occasion from the USDA NHANES/WWEIA food diaries. The potential for accumulation of toxicity was accounted for by computing the degree to which exposures could be discounted between exposure occasions, assuming a two-hour half-life. Further discussion of the methodology used to compute the exposure based on the eating and drinking occasions may be found in a 2006 memo by S. Nako (D299889, 01-NOV-2006).

VI. Toxicological Information

The Agency evaluated the toxicity profile for aldicarb and considered the human acute oral study to be appropriate for assessment of the acute dietary exposure and risks, refer to Aldicarb Human Health Risk Assessment for the evaluation of EPA's Human Studies Review Board (D424564, 25-MAR-2016). A chronic assessment was not conducted because the toxicity database for aldicarb indicates that cholinesterase inhibition is the most sensitive effect found, the magnitude of cholinesterase inhibition does not increase with continued exposure, and that cholinesterase inhibition is generally reversible within 24 hours at the levels relevant to the dietary risk assessment. The longer-term exposures could be considered as a series of acute exposures, with regard to cholinesterase inhibition. All other effects noted in the sub-chronic and chronic toxicity studies were observed at higher doses. Aldicarb is classified as not likely to be carcinogenic to humans.

A Comparative Cholinesterase Assay (CCA) was used to modify the Food Quality Protection Act (FQPA) factor for aldicarb (L. Taylor, 13-JUL-2010, D376136). The acute adverse effect of cholinesterase inhibition tends to reverse itself within hours following exposure to aldicarb. The available toxicological data indicates that aldicarb has an estimated half-life for RBC ChE inhibition of two hours based on data from rats and human subjects. A summary of the doses and endpoints relevant to dietary exposure assessment are shown in Table 4 below.

| Table 4. Summary of Toxicological Doses and Endpoints for Aldicarb for Use in Dietary Exposure Risk Assessments | | | | |
|---|-------------------------------------|--|--|---|
| Exposure Scenario | Point of Departure | Uncertainty/FQPA Safety Factors ¹ | RfD, PAD, Level of Concern | Study and Toxicological Effects |
| Acute Dietary: (All Populations) | BMDL ₁₀ = 0.013 mg/kg | FQPA SF = 4.8X UF _H = 10 | Acute RfD = aPAD = 0.00027 mg/kg/day | Human oral study MRIDs. 43829602, 45068601, 43442302, |

| Table 4. Summary of Toxicological Doses and Endpoints for Aldicarb for Use in Dietary Exposure Risk Assessments | | | | |
|---|--|---|----------------------------|--|
| Exposure Scenario | Point of Departure | Uncertainty/ FQPA Safety Factors ¹ | RfD, PAD, Level of Concern | Study and Toxicological Effects |
| | | UF _A = 1x | | 43442305, 42373001 BMD ₁₀ = 0.02 mg/kg, based on RBC cholinesterase inhibition |
| Chronic Dietary: (All Populations) | A quantitative chronic assessment was not conducted because the toxicity database for aldicarb indicates that the magnitude of ChEI does not increase with continued exposure, due to the reversibility of ChEI (< 24 hours). There are no chronic toxic effects more sensitive than ChEI. | | | |
| Cancer | Classification: Aldicarb is classified as “Not Likely to be Carcinogenic to Humans”, based on the lack of evidence of carcinogenicity in studies in rats and mice and the absence of a mutagenicity concern. | | | |

ChEI = acetylcholinesterase inhibition. Point of Departure (POD) = A data point or an estimated point that is derived from observed dose-response data and used to mark the beginning of extrapolation to determine risk associated with lower environmentally relevant human exposures. NOAEL = no observed adverse effect level. LOAEL = lowest observed adverse effect level. UF = uncertainty factor. UF_A = extrapolation from animal to human (interspecies). UF_H = potential variation in sensitivity among members of the human population (intraspecies). BMD₁₀ = Benchmark Dose; dose that corresponds to 10% response in ChEI. BMDL₁₀ = Benchmark Dose estimate based on the lower 95% confidence interval where 10% ChEI would be observed. FQPA SF = FQPA Safety Factor. PAD = population adjusted dose. a = acute. RfD = reference dose. MOE = margin of exposure. LOC = level of concern.

VII. Results/Discussion

As stated above, for acute assessments, HED is concerned when dietary risk exceeds 100% of the aPAD. The DEEM-FCID analyses estimate the dietary exposure and risk of the U.S. population and various population subgroups. The results reported in Tables 5 and 6 are for the general U.S. Population, all infants (<1 year old), children 1-2, children 3-5, children 6-12, youth 13-19, females 13-49, adults 20-49, and adults 50-99 years. Acute assessments were conducted using water concentrations reflecting the Florida percent crop area (PCA) assumption of 14.2% (Table 5); and using water concentrations reflecting the Texas PCA assumption of 20.8% (Table 6). All runs assumed percent crop treated estimates for orange and grapefruit determined assuming production cap limits for aldicarb (100,000 acres per year).

Risk estimates for the 3-inch incorporation depth scenario are not of concern. Based on Florida PCA refined EDWCs, at the 99.9th percentile of exposure, the general U.S. population occupies 44% aPAD. The most highly exposed population subgroup, children 1-2 years old, occupies 95% aPAD. Based on Texas PCA refined EDWCs, at the 99.9th percentile of exposure, the general U.S. population occupies 46% aPAD. The most highly exposed population subgroup, children 1-2 years old, occupies 97% aPAD.

Risk estimates for the 2-inch incorporation depth scenario are of concern. Based on Florida PCA refined EDWCs, at the 99.9th percentile of exposure, the general U.S. population occupies 54% aPAD. The most highly exposed population subgroup, children 1-2 years old, occupies 103% aPAD. Based on Texas PCA refined EDWCs, at the 99.9th percentile of exposure, the general U.S. population occupies 65% aPAD. The most highly exposed population subgroup, children 1-2 years old, occupies 126% aPAD.

Table 5. Summary of Acute Dietary (Food and Drinking Water) Exposure and Risk for Aldicarb Assuming Surface Water Residues Based on FL PCA Scenario at 99.9th Percentile.

| Population Subgroup | 2-inch Incorporation Depth | | 3-inch Incorporation Depth | |
|--------------------------------|----------------------------|------------|----------------------------|-----------|
| | Exposure (mg/kg/day) | % aPAD | Exposure (mg/kg/day) | % aPAD |
| General U.S. Population | 0.000144 | 53 | 0.000117 | 43 |
| All Infants (<1 year old) | 0.000180 | 67 | 0.000128 | 47 |
| Children 1-2 years old* | 0.000278 | 103 | 0.000256 | 95 |
| Children 3-5 years old | 0.000207 | 77 | 0.000186 | 69 |
| Children 6-12 years old | 0.000155 | 58 | 0.000125 | 46 |
| Youth 13-19 years old | 0.000100 | 37 | 0.000071 | 26 |
| Adults 20-49 years old | 0.000118 | 44 | 0.000082 | 30 |
| Adults 50-99 years old | 0.000104 | 39 | 0.000073 | 27 |
| Females 13-49 years old | 0.000113 | 42 | 0.000072 | 27 |

* The population with the highest risk estimate is in bold.

Table 6. Summary of Acute Dietary (Food and Drinking Water) Exposure and Risk for Aldicarb Assuming Surface Water Residues Based on TX PCA Scenario at 99.9th Percentile.

| Population Subgroup | 2-inch Incorporation Depth | | 3-inch Incorporation Depth | |
|--------------------------------|----------------------------|------------|----------------------------|-----------|
| | Exposure (mg/kg/day) | % aPAD | Exposure (mg/kg/day) | % aPAD |
| General U.S. Population | 0.000176 | 65 | 0.000124 | 46 |
| All Infants (<1 year old) | 0.000260 | 96 | 0.000134 | 50 |
| Children 1-2 years old* | 0.000339 | 126 | 0.000261 | 97 |
| Children 3-5 years old | 0.000232 | 86 | 0.000206 | 76 |
| Children 6-12 years old | 0.000205 | 76 | 0.000139 | 51 |
| Youth 13-19 years old | 0.000122 | 45 | 0.000080 | 30 |
| Adults 20-49 years old | 0.000158 | 58 | 0.000092 | 34 |
| Adults 50-99 years old | 0.000138 | 51 | 0.000083 | 31 |
| Females 13-49 years old | 0.000150 | 55 | 0.000085 | 31 |

* The population with the highest risk estimate is in bold.

VIII. Characterization of Inputs/Outputs

HED has conducted refined acute dietary exposure and risk assessments for aldicarb and its metabolites. The assumptions made in this acute dietary assessment include PDP monitoring data, anticipated residues, empirical processing factors, default DEEM processing factors, and percent crop treated as provided by BEAD. Moreover, the percent of commodity imported was considered for potato, grapefruit, lemons, oranges, coffee and pecans.

X. Conclusions

Refined probabilistic dietary exposure assessments for aldicarb show that food and water exposures do not exceed HED's level of concern for any population subgroup at the 99.9th percentile of exposure, when aldicarb is applied 3 inches below the surface, and following production cap limits for orange and grapefruit. Orange, orange juice, and drinking water were the risk drivers in these assessments. HED is confident that this assessment does not underestimate risk to the general U.S. population or any population subgroup.

XI. List of Attachments

Attachment 1. Data and Residue Estimates Used in the Dietary Exposure Analyses

Attachment 2. Import Usage and SLUA for Aldicarb

Attachment 3. Aldicarb Food and Water Input File

Attachment 4. Aldicarb Food and Water Result File: FL PCA, 2-inch Depth

Attachment 5. Aldicarb Food and Water Result File: FL PCA, 3-inch Depth

Attachment 6. Aldicarb Food and Water Result File: TX PCA, 2-inch Depth

Attachment 7. Aldicarb Food and Water Result File: TX PCA, 3-inch Depth

Attachment 1. Data and Residue Estimates Used in the Dietary Exposure Analyses

| Table A.1.1. Summary of PDP Data for Aldicarb and its Sulfone and Sulfoxide Metabolites.* | | | | | | | |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Number of Samples Analyzed | | | | | | | |
| Commodity | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
| Sweet Potato | | | 184 | 739 | 553 | | |
| Sweet Potato Baby Food | | | | | 191 | 585 | |
| Orange | | | | 744 | 744 | | |
| Orange Juice | | | | | 191 | 199 | 330 |

* The three residues of concern were measured in each sample.

| A.1.2. PDP Data for Select Commodities | | | | | | |
|---|--------------------------|-----------------|---------------------------|--------------------------|-----------------|---------------------------|
| Commodity | PDP Total Samples | | | PDP Total Detects | | |
| | Total | Domestic | Imports or Unknown | Total | Domestic | Imports or Unknown |
| Sweet Potatoes (2008, 2009, 2010) | 1476 | 1458 | 18 | 5 | 4 | 1 |
| Sweet Potatoes baby food (2010, 2011) | 776 | 771 | 5 | 0 | 0 | 0 |
| Oranges (2009, 2010) | 1488 | 1365 | 123 | 5 | 4 | 0 |
| Grapefruit (2005, 2006) | 1462 | 1441 | 21 | 5 | 5 | 0 |

| Table A.1.3. Data and Residue Estimates Used in the Dietary Exposure Analyses. | | | | | | | | | |
|--|---|--------------------------------------|-----------------------------|----------------|---|--------|------------------------------|--------------------|------------------------------------|
| RAC | Food Forms | Blending Classification ¹ | Data Source ² | No. of Samples | No. of Detectable Residues ³ | ½ LOD | %CT ⁴ or % Import | Processing Factors | Anticipated Residue Estimates |
| | | | | | | | | | Acute (Tol., AR, RDF) ² |
| Potato, chips Potato, fried | All | B | PDP Potato w/peel 2008/2009 | 1488 | 62/1 | 0.0052 | 4 | 0.62 | 0.000232 (Import) |
| Potato, dry | All | B | PDP Potato w/peel 2008/2009 | 1488 | 62/1 | 0.0052 | 4 | 6.5 | 0.000232 (Import) |
| Potato, dry, baby food (bf) | All | B | PDP Potato w/peel 2008/2009 | 1488 | 62/1 | 0.0052 | 4 | 6.5 | 0.000232 (Import) |
| Potato, flour | All | B | PDP Potato w/peel 2008/2009 | 1488 | 62/1 | 0.0052 | 4 | 6.5 | 0.000232 (Import) |
| Potato, flour bf | All | B | PDP Potato w/peel 2008/2009 | 1488 | 62/1 | 0.0052 | 4 | 6.5 | 0.000232 (Import) |
| Sweet potato | Boiled; Canned :Cooked; Canned :Boiled | PB/NB | PDP Sweet potato 2008-2010 | 1476 | 5 | 0.0109 | 34 | 0.5 | RDF 1 |
| | All Others | PB/NB | PDP Sweet potato 2008-2010 | 1476 | 5 | 0.0109 | 34 | | RDF 1 |
| Sweet potato, bf | Cooked :Fresh | PB/NB | PDP Sweet potato 2010/2011 | 776 | 0 | 0.0083 | 34 | | RDF 2 |
| | Cooked :Canned | PB/NB | PDP Sweet potato 2010/2011 | 776 | 0 | 0.0083 | 34 | 0.5 | RDF 2 |
| Soybean, seed | All | B | FTD D299883 | | | | 2.5 | | 0.00855 Mean 0.000214 AR |
| Soybean, soy milk | All | B | FTD D299883 | | | | 2.5 | | 0.00855 Mean 0.000214 AR |
| Soybean, soy milk, bf | All | B | FTD D299883 | | | | 2.5 | | 0.00855 Mean 0.000214 AR |

| Table A.1.3. Data and Residue Estimates Used in the Dietary Exposure Analyses. | | | | | | | | | |
|--|---|--------------------------------------|--------------------------|----------------|---|-------|------------------------------|--------------------|------------------------------------|
| RAC | Food Forms | Blending Classification ¹ | Data Source ² | No. of Samples | No. of Detectable Residues ³ | ½ LOD | %CT ⁴ or % Import | Processing Factors | Anticipated Residue Estimates |
| | | | | | | | | | Acute (Tol., AR, RDF) ² |
| Soybean, oil | All | B | FTD D299883 | | | | 2.5 | 0.3 | 0.00855 Mean 0.000214 AR |
| Soybean, oil, bf | All | B | FTD D299883 | | | | 2.5 | 0.3 | 0.00855 Mean 0.000214 AR |
| Soybean, flour | All | B | FTD D299883 | | | | 2.5 | | 0.00855 Mean 0.000214 AR |
| Soybean, flour, bf | All | B | FTD D299883 | | | | 2.5 | | 0.00855 Mean 0.000214 AR |
| Bean, black, seed | Baked, boiled, fried, canned:cooked; canned:boiled; cooked:NS | B | FTD D299883 | | | | 2.5 | 0.05 | 0.00855 Mean 0.000214 AR |
| Bean, broad, seed | Baked, boiled, fried, canned:cooked; canned:boiled; cooked:NS | B | FTD D299883 | | | | 2.5 | 0.05 | 0.00855 Mean 0.000214 AR |
| Bean, cowpea, seed | Baked, boiled, fried, canned:cooked; canned:boiled; cooked:NS | B | FTD D299883 | | | | 2.5 | 0.05 | 0.00855 Mean 0.000214 AR |
| Bean, great northern, seed | Baked, boiled, fried, canned:cooked; canned:boiled; cooked:NS | B | FTD D299883 | | | | 2.5 | 0.05 | 0.00855 Mean 0.000214 AR |
| Bean, kidney, seed | Baked, boiled, fried, canned:cooked; canned:boiled; cooked:NS | B | FTD D299883 | | | | 2.5 | 0.05 | 0.00855 Mean 0.000214 AR |
| Bean, lima, seed | Baked, boiled, fried, canned:cooked; canned:boiled; cooked:NS | B | FTD D299883 | | | | 2.5 | 0.05 | 0.00855 Mean 0.000214 AR |
| Bean, mung, seed | Baked, boiled, fried, canned:cooked; canned:boiled; cooked:NS | B | FTD D299883 | | | | 2.5 | 0.05 | 0.00855 Mean 0.000214 AR |
| Bean, navy, seed | Baked, boiled, fried, canned:cooked; canned:boiled; cooked:NS | B | FTD D299883 | | | | 2.5 | 0.05 | 0.00855 Mean 0.000214 AR |

| Table A.1.3. Data and Residue Estimates Used in the Dietary Exposure Analyses. | | | | | | | | | |
|--|---|--------------------------------------|---------------------------------|----------------|---|--------|------------------------------|--------------------|------------------------------------|
| RAC | Food Forms | Blending Classification ¹ | Data Source ² | No. of Samples | No. of Detectable Residues ³ | ½ LOD | %CT ⁴ or % Import | Processing Factors | Anticipated Residue Estimates |
| | | | | | | | | | Acute (Tol., AR, RDF) ⁵ |
| Bean, pink, seed | Baked, boiled, fried, canned:cooked; canned:boiled; cooked:NS | B | FTD D299883 | | | | 2.5 | 0.05 | 0.00855 Mean 0.000214 AR |
| Bean, pinto, seed | Baked, boiled, fried, canned:cooked; canned:boiled; cooked:NS | B | FTD D299883 | | | | 2.5 | 0.05 | 0.00855 Mean 0.000214 AR |
| Chickpea, seed | Baked, boiled, fried, canned:cooked; canned:boiled; cooked:NS | B | FTD D299883 | | | | 2.5 | 0.05 | 0.00855 Mean 0.000214 AR |
| Orange | All | NB/PB | PDP Orange 2009/2010 | 1488 | 4 | 0.0131 | 13 | | RDF 3 |
| Orange, juice | All | PB | PDP Orange Juice 2010/2011/2012 | 1106 | 5 | 0.0042 | 63 | | RDF 4 |
| Orange, juice, bf | All | PB | PDP Orange Juice 2010/2011/2012 | 1106 | 5 | 0.0042 | 63 | | RDF 4 |
| Orange, peel | All | PB | PDP Orange 2009/2010 | 1488 | 4 | 0.0131 | 13 | | RDF 3 |
| Lemon | All | NB/PB | PDP Orange 2009/2010 | 1488 | 4 | 0.0131 | 10 | | RDF 5 |
| Lemon, juice | All | PB | PDP Orange Juice 2010/2011/2012 | 1106 | 5 | 0.0042 | 10 | | RDF 6 |
| Lemon, peel | All | PB | PDP Orange 2009/2010 | 1488 | 4 | 0.0131 | 10 | | RDF 5 |
| Lime | All | NB | PDP Orange 2009/2010 | 1488 | 4 | 0.0131 | 100 | | RDF 7 |
| Lime, juice | All | PB | PDP Orange Juice 2010/2011/2012 | 1106 | 5 | 0.0042 | 100 | | RDF 8 |
| Lime, juice, bf | All | PB | PDP Orange Juice 2010/2011/2012 | 1106 | 5 | 0.0042 | 100 | | RDF 8 |

| Table A.1.3. Data and Residue Estimates Used in the Dietary Exposure Analyses. | | | | | | | | | |
|--|------------|--------------------------------------|---------------------------------|----------------|---|--------|------------------------------|--------------------|------------------------------------|
| RAC | Food Forms | Blending Classification ¹ | Data Source ² | No. of Samples | No. of Detectable Residues ³ | ½ LOD | %CT ⁴ or % Import | Processing Factors | Anticipated Residue Estimates |
| | | | | | | | | | Acute (Tol., AR, RDF) ² |
| Grapefruit | All | NB/PB | PDP Orange 2009/2010 | 1488 | 4 | 0.0131 | 13 | | RDF 9 |
| Grapefruit, juice | All | PB | PDP Orange Juice 2010/2011/2012 | 1106 | 5 | 0.0042 | 16 | | RDF 10 |
| Pecan | All | PB | FTD D299883 | | 22 | | 58 | | RDF 11 |
| Cottonseed, oil | All | B | FTD D425180 | | | | 35 | 0.1 | 0.0453 Mean 0.0159 AR |
| Cottonseed, oil, bf | All | B | FTD D425180 | | | | 35 | 0.1 | 0.0453 Mean 0.0159 AR |
| Peanut | All | B | FTD D299883 | | | | 45 | | 0.0047 Mean 0.002115 AR |
| Peanut, oil | All | B | FTD D299883 | | | | 45 | 0.18 | 0.0047 Mean 0.002115 AR |
| Peanut, butter | All | B | FTD D299883 | | | | 45 | 1.2 | 0.0047 Mean 0.002115 AR |

1. Classification: blended (B), partially blended (PB), not blended (NB).

2. Field Trial Data (FTD); Residue Distribution File (RDF); Anticipated Residue (AR); Baby food (bf); with (w); without (w/o); Orange (O); Orange Juice (OJ). AR values are calculated as (mean residue) * (%CT). Because the %CT values are incorporated into the residue value (or RDF), Adjustment Factor #2 was not used in the present analyses.

| Table A.1.4. RDF Files and Point Estimate Calculations | | |
|---|---|---|
| <p><u>Potato Blended Processed Commodities: Anticipated Residues</u></p> <p>Residue estimate for a blended processed commodity based on monitoring data and % of imports.</p> <p>PDP Data for Potato with Peel Uncooked: POFR (2008, 2009), Total Samples=1488, Total Detects=1, Sum of Detects=0.03796 ppm, Total LODs=59, Avg HLOD=0.0052; 4% of Imported Potatoes.</p> <p>Total Samples with Residues = 60 $\frac{1}{2}$LOD = 0.0052 ppm Total Samples $\frac{1}{2}$ LOD = 59 Sum of Detects = 0.03796 ppm</p> <p>Anticipated residue: 0.000232 ppm [(59 samples*0.0052 ppm + 0.03796 ppm)/1488]</p> | <p><u>Soybean and Dry Bean: Anticipated Residues</u></p> <p>Average residue values reported in D299883 (C. Olinger, 16-AUG-2010) were used. The %CT for soybean and dry beans is 2.5%.</p> <p>Average residue: 0.00855 ppm</p> <p>Anticipated residue: 0.000214 ppm [0.00855 ppm x 0.025 (fraction of crop treated)]</p> | <p><u>Cotton seed oil: Anticipated Residues</u></p> <p>Residue estimate for a blended commodity based on crop field trial data.</p> <p>Mean residue: 0.0453 ppm Anticipated residue: 0.0159 ppm [0.0453 ppm x 0.35 (fraction of crop treated)]</p> |
| <p><u>RDF 1 Potato Sweet.rdf</u></p> <p>PDP Data: SWFR (2008,2009,2010), Total Samples=1476, Total Detects=5, Total LODs=1471, Total Zeros=974 MaxPCT=34, Avg Residue (Detects)=0.038920, Avg Residue (TOTALS)=0.0017, Avg HLOD (NonDetects)=0.0109</p> <p>TOTALZ=974 TOTALLOD=497 LODRES=0.0109 0.07784 0.06594 0.02126 0.01478 0.01478</p> | <p><u>RDF 2 Potato Sweet BF.rdf</u></p> <p>PDP Data: ISGJ,ISPC,ISSE; Baby food; (2010,2011), Total Samples=776, Total Detects=0, Total LODs=116, Total Zeros=512 MaxPCT=34, Avg Residue (TOTALS)=0.0012, Avg HLOD (NonDetects)=0.0083</p> <p>TOTALZ=512 TOTALLOD=264 LODRES=0.0083</p> | <p><u>RDF 3 Orange_FL TX 13 pct dec 2020.rdf</u></p> <p>PDP Data: OGFR (2009,2010), Total Samples=1488, Total Detects=4, Total LODs=189, Total Zeros=1295 '13% Crop Treated, Avg Residue (Detects)=0.018950, Avg Residue (TOTALS)=0.0131, Avg HLOD (NonDetects)=0.0131</p> <p>TOTALZ=1295 TOTALLOD=189 LODRES=0.0131</p> <p>0.02126 0.02034 0.01942 0.01478</p> |
| <p><u>RDF 4 Orange_Juice_FL TX 63 pct dec 2020.rdf</u></p> <p>'PDP Data: OJCO,OJFZ,OJRE (2010,2011,2012), Total Samples=1106, Total Detects=5, Total LODs=692, Total Zeros=409 '63% Treated, Avg Residue (Detects)=0.006102, Avg Residue (TOTALS)=0.0042, Avg HLOD (NonDetects)=0.0042</p> | <p><u>RDF 5 Lemon 10 PCT.rdf</u></p> <p>'PDP Data: OGFR (2009,2010), Total Samples=1488, Total Detects=4, Total LODs=145, Total Zeros=1339 '10% Imports, Avg Residue (Detects)=0.018950, Avg Residue (TOTALS)=0.0131, Avg HLOD (NonDetects)=0.0131</p> | <p><u>RDF 6 Lemon_Juice_10 PCT.rdf</u></p> <p>'PDP Data: OJCO,OJFZ,OJRE (2010,2011,2012), Total Samples=1106, Total Detects=5, Total LODs=106, Total Zeros=995 '10% Imports, Avg Residue (Detects)=0.006102, Avg Residue (TOTALS)=0.0042, Avg HLOD (NonDetects)=0.0042</p> |

| | | |
|---|--|--|
| TOTALZ=409 TOTALLOD=692 LODRES=0.0042 0.00647 0.00647 0.00647 0.00555 0.00555 | TOTALZ=1339 TOTALLOD=145 LODRES=0.0131 0.02126 0.02034 0.01942 0.01478 | TOTALZ=995 TOTALLOD=106 LODRES=0.0042 0.00647 0.00647 0.00647 0.00555 0.00555 |
| <u>RDF 7 Lime 100PCT based on Orange PDP.rdf</u> 'PDP Data: OGFR (2009,2010), Total Samples=1488, Total Detects=4, 'Total LODs=1484, Total Zeros=0; MaxPCT=1.000, Avg Residue '(Detects)=0.018950, Avg Residue (TOTALS)=0.0131, Avg Residue '(Blended, PCT=100)=0.013133, Avg HLOD (NonDetects)=0.0131 TOTALZ=0 TOTALLOD=1484 LODRES=0.0131 0.02126 0.02034 0.01942 0.01478 | <u>RDF 8 Lime Juice 100PCT based on Orange Juice PDP.rdf</u> 'PDP Data: OJCO,OJFZ,OJRE (2010,2011,2012), Total Samples=1106, 'Total Detects=5, Total LODs=1101, Total Zeros=0 'MaxPCT=1.000, Avg Residue (Detects)=0.006102, Avg Residue (TOTALS)=0.0042, Avg Residue (Blended, PCT=100)=0.004179, Avg 'HLOD (NonDetects)=0.0042 TOTALZ=0 TOTALLOD=1101 LODRES=0.0042 0.00647 0.00647 0.00647 0.00555 0.00555 | <u>RDF 9 Grapefruit FL TX 13 PCT dec 2020.rdf</u> 'PDP Data: OGFR (2009,2010), Total Samples=1488, Total Detects=4, Total LODs=189, Total Zeros=1295 '13% Treated, Avg Residue (Detects)=0.018950, Avg Residue (TOTALS)=0.0131, Avg HLOD (NonDetects)=0.0131 TOTALZ=1295 TOTALLOD=189 LODRES=0.0131 0.02126 0.02034 0.01942 0.01478 |
| <u>RDF 10 Grapefruit juice FL TX 16 PCT dec 2020.rdf</u> 'PDP Data: OJCO,OJFZ,OJRE (2010,2011,2012), Total Samples=1106, Total Detects=5, Total LODs=172, Total Zeros=929 '16% treated, Avg Residue (Detects)=0.006102, Avg Residue (TOTALS)=0.0042, Avg HLOD (NonDetects)=0.0042 TOTALZ=929 TOTALLOD=172 LODRES=0.0042 0.00647 0.00647 0.00647 0.00555 0.00555 | <u>RDF 11 Pecan_FTD_58Perc Import.rdf</u> 'Pecan Aldicarb FTD 58% Imports (%Imports provided on 11/25/2015) 'Field Trial Residue Data [MRID No. 102123]; 22 treated samples 'Estimated Maximum %CT = 58% (Not on label; import use) TOTALZ=16 TOTALLOD=0 LODRES=0.004 4,0.0043 2,0.0171 2,0.0256 2,0.0427 2,0.00855 0.0342 0.0684 0.0598 0.0513 0.0769 | <u>RDF 12a. Aldicarb SW 3 inch no TX.rdf</u> Aldicarb Surface Water Citrus scenario 3.0 inch depth FL PCA dec 2020 PRZM-SW Model 1962-1990 simulation 3.79183E-16 3.63506E-16 3.48823E-16 3.34978E-16 3.21701E-16 3.0885E-16 2.96496E-16 ± ± ± ± |

| | | |
|---|---|--|
| | 0.0940 0.0855 0.231 0.103 0.145 | |
| <u>RDF 12b. Aldicarb SW 3.0 inch depth_TX.rdf</u> Aldicarb Surface Water Citrus scenario 3.0 inch depth TX PCA Oct 2020 PRZM-SW Model 1962-1990 simulation 5.55422E-16 5.32459E-16 5.10952E-16 4.90672E-16 4.71224E-16 4.524E-16 4.34304E-16 4.17019E-16 4.00566E-16 . . . | <u>RDF 12c. Citrus FL 2 in SW no TX.rdf</u> 'Aldicarb Surface Water 'Citrus scenario 2.0 inch depth FL PCA Dec 2020 'PRZM-SW Model '1962-1990 simulation 8.5315E-16 8.17877E-16 7.84834E-16 7.53679E-16 7.23817E-16 6.9492E-16 6.67116E-16 6.40576E-16 6.153E-16 | <u>RDF 12d. Aldicarb SW 2.0 inch depth_TX.rdf</u> Aldicarb Surface Water Citrus scenario 2.0 inch depth TX PCA Oct 2020 PRZM-SW Model 1962-1990 simulation 1.24968E-15 1.19802E-15 1.14962E-15 1.10398E-15 1.06024E-15 1.01791E-15 9.77184E-16 9.38309E-16 9.01285E-16 |

Attachment 2. Import Usage and SLUA for Aldicarb**A.2.1. Refined Import Usage Analysis Addressing Registrant Comments.**

BEAD prepared the following refined PCT recommendations in response to Registrant comments reflecting the contention that aldicarb use has been banned in several countries which import crops into the U.S.A (BEAD memos: D. Atwood, 28-OCT-2016; and D. Atwood, 01-MAR-2017). Where there is overlap between the crops listed in A.2.1 and A.2.2, the values in A.2.2 were used in the dietary analysis as these values are considered refined.

| Table A.2.1. Summary of Refined Aldicarb PCT Values | | |
|--|-------------------------------|------------------------|
| Commodity | Recommended PCT Values | |
| | Average (chronic) | Maximum (acute) |
| Potatoes | | |
| Fresh | 0 | 0 |
| Frozen | 0 | 0 |
| Processed | 3 | 4 |
| Sweet Potatoes | 31 | 34 |

A.2.2. Screening Level Usage Analysis for Aldicarb**December 18, 2014****Screening Level Estimates of Agricultural Uses of Aldicarb (098301)****Sorted Alphabetically****(Reporting Timeframe: 2004-2012)**

| | | | Percent Crop Treated | |
|------|----------------|----------------------|----------------------|---------|
| Crop | | Average Lbs. A.I. | Average | Maximum |
| 1 | Almonds+ | 2,000 | <1 | <2.5 |
| 2 | Cantaloupes+ | <500 | <1 | <2.5 |
| 3 | Cotton | 1,600,000 | 20 | 35 |
| 4 | Dry Beans/Peas | 10,000 | <2.5 | <2.5 |
| 5 | Grapefruit+ | 100,000 | 35 | 55 |
| 6 | Lemons+ | <500 | <1 | <2.5 |
| 7 | Oranges+ | 500,000 | 15 | 35 |
| 8 | Peanuts | 400,000 | 35 | 45 |
| 9 | Pecans+ | 10,000 | <2.5 | <2.5 |
| 10 | Potatoes+ | 200,000 | 5 | 15 |
| 11 | Sorghum+ | 2,000 | <1 | <2.5 |
| 12 | Soybeans | 60,000 | <1 | <2.5 |
| 13 | Sugar Beets | 100,000 | 5 | 10 |
| 14 | Sugarcane+ | 7,000 | <2.5 | <2.5 |
| 15 | Tangerines+ | 6,000 | 5 | 5 |
| 16 | Tobacco+ | 20,000 | 5 | 10 |
| 17 | Watermelons+ | <500 | <1 | <2.5 |

All numbers rounded.

<500 Less than 500 pounds of active ingredient

<2.5 Less than 2.5 percent of crop treated

<1 Less than 1 percent of crop treated

+ There is no current active registration for this use.

SLUA data sources include:

USDA-NASS (United States Department of Agriculture's National Agricultural Statistics Service)

Private Pesticide Market Research

These results reflect amalgamated data developed by the Agency and are releasable to the public.

Attachment 3. Aldicarb Food and Water Input File: TX PCA, 3-inch Depth

Filename: C:\Users\wdonovan\Documents\Install\DEEM CALENDEX FCID\DEEM Version
 3.16\098301\Production Cap\3 inch runs\098301aFLTX food water 3 inch TX pca prod cap dec 24
 2020.R08

Chemical: Aldicarb

RfD(Chronic): 0 mg/kg bw/day NOEL(Chronic): 0 mg/kg bw/day

RfD(Acute): .00027 mg/kg bw/day NOEL(Acute): 0 mg/kg bw/day

Date created/last modified: 12-24-2020/14:35:16 Program ver. 3.16, 03-08-d

Comment: Acute food water TX pca 3 inch dec 24 2020

 RDL indices and parameters for Monte Carlo Analysis:

| Index # | Dist Code | Parameter #1 | Param #2 | Param #3 | Comment |
|---------|-----------|--------------|----------|----------|---------|
|---------|-----------|--------------|----------|----------|---------|

| | | | | | |
|----|---|---|--|--|--|
| 1 | 6 | RDF 1 Potato_Sweet.rdf | | | |
| 2 | 6 | RDF 2 Potato_Sweet_BF.rdf | | | |
| 3 | 6 | RDF 3 Orange_FL TX 13 pct dec 2020.rdf | | | |
| 4 | 6 | RDF 4 Orange_Juice_FL TX 63 pct dec 2020.rdf | | | |
| 5 | 6 | RDF 5 Lemon_10 PCT.rdf | | | |
| 6 | 6 | RDF 6 Lemon_Juice_10 PCT.rdf | | | |
| 7 | 6 | RDF 7 Lime_100PCT based on Orange PDP.rdf | | | |
| 8 | 6 | RDF 8 Lime_Juice 100PCT based on Orange Juice PDP.rdf | | | |
| 9 | 6 | RDF 9 Grapefruit FL TX 13 PCT dec 2020.rdf | | | |
| 10 | 6 | RDF 10 Grapefruit juice FL TX 16 PCT dec 2020.rdf | | | |
| 11 | 6 | RDF 11 Pecan_FTD_58Perc Import.rdf | | | |
| 12 | 6 | Aldicarb SW 3.0 inch depth_TX.rdf | | | |

| EPA Code | Crop Grp | Commodity Name | Def Res (ppm) | Adj.Factors #1 | Adj.Factors #2 | RDLComment Pntr |
|------------|----------|---|---------------|----------------|----------------|-----------------|
| 0103296000 | 1C | Potato, chips | 0.000232 | 0.620 | 1.000 | |
| 0103297000 | 1C | Potato, dry (granules/ flakes) | 0.000232 | 6.500 | 1.000 | |
| 0103297001 | 1C | Potato, dry (granules/ flakes)-b | 0.000232 | 6.500 | 1.000 | |
| 0103298000 | 1C | Potato, flour | 0.000232 | 6.500 | 1.000 | |
| 0103298001 | 1C | Potato, flour-babyfood | 0.000232 | 6.500 | 1.000 | |
| 0103366000 | 1CD | Sweet potato | | | | |
| | | 210-Cooked; Fresh or N/S; Cook Meth N/S | 1.000000 | 1.000 | 1.000 | 1 |
| | | 211-Cooked; Fresh or N/S; Baked | 1.000000 | 1.000 | 1.000 | 1 |
| | | 212-Cooked; Fresh or N/S; Boiled | 1.000000 | 0.500 | 1.000 | 1 |
| | | 213-Cooked; Fresh or N/S; Fried | 1.000000 | 0.620 | 1.000 | 1 |
| | | 215-Cooked; Fresh or N/S; Boiled/baked | 1.000000 | 1.000 | 1.000 | 1 |
| | | 240-Cooked; Canned; Cook Meth N/S | 1.000000 | 0.500 | 1.000 | 1 |
| | | 242-Cooked; Canned; Boiled | 1.000000 | 0.500 | 1.000 | 1 |
| 0103366001 | 1CD | Sweet potato-babyfood | | | | |
| | | 211-Cooked; Fresh or N/S; Baked | 1.000000 | 1.000 | 1.000 | 2 |
| | | 240-Cooked; Canned; Cook Meth N/S | 1.000000 | 0.500 | 1.000 | 2 |
| 0600347000 | 6 | Soybean, seed | 0.000214 | 1.000 | 1.000 | |
| 0600349000 | 6 | Soybean, soy milk | 0.000214 | 1.000 | 1.000 | |
| 0600349001 | 6 | Soybean, soy milk-babyfood or in | 0.000214 | 1.000 | 1.000 | |
| 0600350000 | 6 | Soybean, oil | 0.000214 | 0.300 | 1.000 | |
| 0600350001 | 6 | Soybean, oil-babyfood | 0.000214 | 0.300 | 1.000 | |
| 0603030000 | 6C | Bean, black, seed | 0.000214 | 0.050 | 1.000 | |
| 0603032000 | 6C | Bean, broad, seed | 0.000214 | 0.050 | 1.000 | |
| 0603034000 | 6C | Bean, cowpea, seed | 0.000214 | 0.050 | 1.000 | |
| 0603035000 | 6C | Bean, great northern, seed | 0.000214 | 0.050 | 1.000 | |
| 0603036000 | 6C | Bean, kidney, seed | 0.000214 | 0.050 | 1.000 | |
| 0603038000 | 6C | Bean, lima, seed | 0.000214 | 0.050 | 1.000 | |
| 0603039000 | 6C | Bean, mung, seed | 0.000214 | 0.050 | 1.000 | |
| 0603040000 | 6C | Bean, navy, seed | 0.000214 | 0.050 | 1.000 | |

| | | | | | | |
|------------|-----|------------------------------|----------|-------|-------|----|
| 0603041000 | 6C | Bean, pink, seed | 0.000214 | 0.050 | 1.000 | |
| 0603042000 | 6C | Bean, pinto, seed | 0.000214 | 0.050 | 1.000 | |
| 0603098000 | 6C | Chickpea, seed | 0.000214 | 0.050 | 1.000 | |
| 0603098001 | 6C | Chickpea, seed-babyfood | 0.000214 | 0.050 | 1.000 | |
| 0603099000 | 6C | Chickpea, flour | 0.000214 | 0.050 | 1.000 | |
| 0603182000 | 6C | Guar, seed | 0.000214 | 0.050 | 1.000 | |
| 0603182001 | 6C | Guar, seed-babyfood | 0.000214 | 0.050 | 1.000 | |
| 0603348000 | 6C | Soybean, flour | 0.000214 | 1.000 | 1.000 | |
| 0603348001 | 6C | Soybean, flour-babyfood | 0.000214 | 1.000 | 1.000 | |
| 1001240000 | 10A | Orange | 1.000000 | 1.000 | 1.000 | 3 |
| 1001241000 | 10A | Orange, juice | 1.000000 | 1.000 | 1.000 | 4 |
| 1001241001 | 10A | Orange, juice-babyfood | 1.000000 | 1.000 | 1.000 | 4 |
| 1001242000 | 10A | Orange, peel | 1.000000 | 1.000 | 1.000 | 3 |
| 1002199000 | 10B | Lemon | 1.000000 | 1.000 | 1.000 | 5 |
| 1002200000 | 10B | Lemon, juice | 1.000000 | 1.000 | 1.000 | 6 |
| 1002200001 | 10B | Lemon, juice-babyfood | 1.000000 | 1.000 | 1.000 | 6 |
| 1002201000 | 10B | Lemon, peel | 1.000000 | 1.000 | 1.000 | 5 |
| 1002206000 | 10B | Lime | 1.000000 | 1.000 | 1.000 | 7 |
| 1002207000 | 10B | Lime, juice | 1.000000 | 1.000 | 1.000 | 8 |
| 1002207001 | 10B | Lime, juice-babyfood | 1.000000 | 1.000 | 1.000 | 8 |
| 1003180000 | 10C | Grapefruit | 1.000000 | 1.000 | 1.000 | 9 |
| 1003181000 | 10C | Grapefruit, juice | 1.000000 | 1.000 | 1.000 | 10 |
| 1400269000 | 14 | Pecan | 1.000000 | 1.000 | 1.000 | 11 |
| 2003128000 | 20C | Cottonseed, oil | 0.015900 | 0.100 | 1.000 | |
| 2003128001 | 20C | Cottonseed, oil-babyfood | 0.015900 | 0.100 | 1.000 | |
| 8601000000 | 86A | Water, direct, all sources | 1.000000 | 1.000 | 1.000 | 12 |
| 8602000000 | 86B | Water, indirect, all sources | 1.000000 | 1.000 | 1.000 | 12 |
| 9500263000 | O | Peanut | 0.002115 | 1.000 | 1.000 | |
| 9500264000 | O | Peanut, butter | 0.002115 | 1.200 | 1.000 | |
| 9500265000 | O | Peanut, oil | 0.002115 | 0.180 | 1.000 | |

Attachment 4. Aldicarb Food and Water Result File: FL PCA, 2-inch Depth

US EPA
DEEM-FCID ACUTE Analysis for ALDICARB
Residue file: 098301a food water 2 inch FL pca prod cap dec 24 2020.R08
Adjustment factor #2 NOT used.
Analysis Date: 12-24-2020/18:48:22 Residue file dated: 12-24-2020/17:17:15
RAC/FF intake reported by eating occasion
Reversal analysis used with half life = 2 hr(s)
MC iterations = 1000; MC list in residue file; MC seed = 8; RNG = MS VB
MC residues held constant for each RAC/FF intake on same day/iteration
Run Comment: "Acute food water 2 inch FL pca prod cap dec 24 2020 "

Summary calculations--per capita:

| | 95th Percentile Exposure | % aRfD | 99th Percentile Exposure | % aRfD | 99.9th Percentile Exposure | % aRfD |
|----------------------|-----------------------------|--------|-----------------------------|--------|-------------------------------|--------|
| Total US Population: | 0.000021 | 7.76 | 0.000051 | 18.80 | 0.000144 | 53.38 |
| All Infants: | 0.000019 | 6.89 | 0.000055 | 20.42 | 0.000180 | 66.54 |
| Children 1-2: | 0.000065 | 24.11 | 0.000131 | 48.48 | 0.000278 | 103.06 |
| Children 3-5: | 0.000055 | 20.35 | 0.000102 | 37.74 | 0.000207 | 76.73 |
| Children 6-12: | 0.000029 | 10.67 | 0.000060 | 22.32 | 0.000155 | 57.54 |
| Youth 13-19: | 0.000023 | 8.66 | 0.000045 | 16.49 | 0.000100 | 36.89 |
| Adults 20-49: | 0.000018 | 6.82 | 0.000038 | 14.25 | 0.000118 | 43.74 |
| Adults 50-99: | 0.000016 | 6.01 | 0.000035 | 13.03 | 0.000104 | 38.68 |
| Female 13-49: | 0.000018 | 6.78 | 0.000040 | 14.65 | 0.000113 | 41.70 |

Attachment 5. Aldicarb Food and Water Result File: FL PCA, 3-inch Depth

US EPA Ver. 3.18, 03-08-d
 DEEM-FCID ACUTE Analysis for ALDICARB NHANES 2003-2008 2-Day
 Residue file: 098301aFLTX food water 3 inch prod cap dec 24 2020.R08
 Adjustment factor #2 NOT used.
 Analysis Date: 12-24-2020/12:58:12 Residue file dated: 12-24-2020/11:40:16
 RAC/FF intake reported by eating occasion
 Reversal analysis used with half life = 2 hr(s)
 MC iterations = 1000; MC list in residue file; MC seed = 8; RNG = MS VB
 MC residues held constant for each RAC/FF intake on same day/iteration
 Run Comment: "Acute FL food water 3 inch dec 24 2020 "
 =====

Summary calculations--per capita:

| | 95th Percentile | | 99th Percentile | | 99.9th Percentile | |
|----------------------|-----------------|--------|-----------------|--------|-------------------|--------|
| | Exposure | % aRfD | Exposure | % aRfD | Exposure | % aRfD |
| | ----- | ----- | ----- | ----- | ----- | ----- |
| Total US Population: | 0.000020 | 7.38 | 0.000047 | 17.32 | 0.000117 | 43.35 |
| All Infants: | 0.000015 | 5.66 | 0.000051 | 18.79 | 0.000128 | 47.37 |
| Children 1-2: | 0.000063 | 23.43 | 0.000126 | 46.51 | 0.000256 | 94.91 |
| Children 3-5: | 0.000053 | 19.70 | 0.000097 | 36.03 | 0.000186 | 69.04 |
| Children 6-12: | 0.000028 | 10.41 | 0.000059 | 21.73 | 0.000125 | 46.42 |
| Youth 13-19: | 0.000022 | 8.32 | 0.000042 | 15.63 | 0.000071 | 26.37 |
| Adults 20-49: | 0.000018 | 6.52 | 0.000035 | 13.02 | 0.000082 | 30.27 |
| Adults 50-99: | 0.000015 | 5.73 | 0.000032 | 11.79 | 0.000073 | 26.97 |
| Female 13-49: | 0.000017 | 6.46 | 0.000037 | 13.66 | 0.000072 | 26.63 |

Attachment 6. Aldicarb Food and Water Result File: TX PCA, 2-inch Depth

US EPA Ver. 3.18, 03-08-d
 DEEM-FCID ACUTE Analysis for ALDICARB NHANES 2003-2008 2-Day
 Residue file: 098301a food water 2 inch TX pca prod cap dec 24 2020.R08
 Adjustment factor #2 NOT used.
 Analysis Date: 12-24-2020/20:47:54 Residue file dated: 12-24-2020/19:18:44
 RAC/FF intake reported by eating occasion
 Reversal analysis used with half life = 2 hr(s)
 MC iterations = 1000; MC list in residue file; MC seed = 8; RNG = MS VB
 MC residues held constant for each RAC/FF intake on same day/iteration
 Run Comment: "Acute food water 2 inch TX pca prod cap dec 24 2020 "
 =====

Summary calculations--per capita:

| | 95th Percentile | | 99th Percentile | | 99.9th Percentile | |
|----------------------|-----------------|--------|-----------------|--------|-------------------|--------|
| | Exposure | % aRfD | Exposure | % aRfD | Exposure | % aRfD |
| | ----- | ----- | ----- | ----- | ----- | ----- |
| Total US Population: | 0.000022 | 8.03 | 0.000055 | 20.32 | 0.000176 | 65.02 |
| All Infants: | 0.000020 | 7.27 | 0.000058 | 21.56 | 0.000260 | 96.47 |
| Children 1-2: | 0.000066 | 24.60 | 0.000137 | 50.86 | 0.000339 | 125.60 |
| Children 3-5: | 0.000056 | 20.57 | 0.000107 | 39.60 | 0.000232 | 86.11 |
| Children 6-12: | 0.000030 | 10.97 | 0.000065 | 23.97 | 0.000205 | 75.99 |
| Youth 13-19: | 0.000024 | 8.80 | 0.000047 | 17.43 | 0.000122 | 45.20 |
| Adults 20-49: | 0.000019 | 7.06 | 0.000041 | 15.21 | 0.000158 | 58.46 |
| Adults 50-99: | 0.000017 | 6.22 | 0.000038 | 14.16 | 0.000138 | 51.26 |
| Female 13-49: | 0.000019 | 7.06 | 0.000042 | 15.45 | 0.000150 | 55.39 |

Attachment 7. Aldicarb Food and Water Result File: TX PCA, 3-inch Depth

US EPA Ver. 3.18, 03-08-d
 DEEM-FCID ACUTE Analysis for ALDICARB NHANES 2003-2008 2-Day
 Residue file: 098301aFLTX food water 3 inch TX pca prod cap dec 24 2020.R08
 Adjustment factor #2 NOT used.
 Analysis Date: 12-24-2020/15:55:17 Residue file dated: 12-24-2020/14:35:16
 RAC/FF intake reported by eating occasion
 Reversal analysis used with half life = 2 hr(s)
 MC iterations = 1000; MC list in residue file; MC seed = 8; RNG = MS VB
 MC residues held constant for each RAC/FF intake on same day/iteration
 Run Comment: "Acute food water TX pca 3 inch dec 24 2020 "
 =====

Summary calculations--per capita:

| | 95th Percentile Exposure | % aRfD | 99th Percentile Exposure | % aRfD | 99.9th Percentile Exposure | % aRfD |
|----------------------|-----------------------------|--------|-----------------------------|--------|-------------------------------|--------|
| | ----- | ----- | ----- | ----- | ----- | ----- |
| Total US Population: | 0.000020 | 7.52 | 0.000048 | 17.88 | 0.000124 | 45.79 |
| All Infants: | 0.000017 | 6.12 | 0.000054 | 19.92 | 0.000134 | 49.72 |
| Children 1-2: | 0.000064 | 23.67 | 0.000126 | 46.85 | 0.000261 | 96.76 |
| Children 3-5: | 0.000054 | 20.07 | 0.000099 | 36.53 | 0.000206 | 76.13 |
| Children 6-12: | 0.000028 | 10.54 | 0.000059 | 22.00 | 0.000139 | 51.32 |
| Youth 13-19: | 0.000023 | 8.48 | 0.000043 | 15.80 | 0.000080 | 29.56 |
| Adults 20-49: | 0.000018 | 6.62 | 0.000036 | 13.45 | 0.000092 | 33.94 |
| Adults 50-99: | 0.000016 | 5.81 | 0.000033 | 12.09 | 0.000083 | 30.81 |
| Female 13-49: | 0.000018 | 6.58 | 0.000038 | 14.10 | 0.000085 | 31.41 |